

STAT

Approved For Release

Held for Tuesday meeting

ILLEGIB

0004-1

8 June 1965

John,

Here is the information I promised you
from our phone conversation this afternoon.

Milt

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TABLE IV
FIGURES OF MERIT - COMPARISON TABLE

HIGH VALUES ARE
DESIRED

Material	Density (ρ)		Modulus of Elasticity (E)		E/ρ	Thermal Conductivity (K)		Specific Heat (C)		Coefficient of Expansion (α)		K_{CQ}
	Grams/cm ³	Lbs/in ³	Newtons/cm ²	Lbs/in ²		Cal/cm-sec - °C	BTU/ft-hr - °F	Cal/gm - °C	BTU/lb - °F	°C ⁻¹	°F ⁻¹	
Fused Quartz	2.20	.080	7.0×10^6	10.1×10^6	3.18×10^6	1.00	.0033	.80	.188	55×10^{-6}	31×10^{-6}	31.9×10^3
Pyrex (7740)	2.35	.085	6.8×10^6	9.8×10^6	2.89×10^6	.91	.0027	.60	.25	3.2×10^{-6}	1.8×10^{-6}	3.38×10^3
Vycor (7900)	2.18	.079	6.7×10^5	9.7×10^5	3.07×10^5	.97	.0022	.53	.19	$.80 \times 10^{-6}$	$.44 \times 10^{-6}$	14.5×10^3
Invar (36%Ni)	8.0	.292	14.8×10^5	21.4×10^5	1.85×10^5	.58	.026	6.3	.045	$.13 \times 10^{-6}$	$.70 \times 10^{-6}$	190×10^3
Titanium	4.54	.164	11.6×10^6	16.8×10^6	2.55×10^6	.80	.042	10.1	126	8.5×10^{-6}	4.7×10^{-6}	39.1×10^3
Magnesium	1.74	.063	4.5×10^5	6.5×10^5	2.59×10^5	.81	.38	92	.25	$.26 \times 10^{-6}$	$.14 \times 10^{-6}$	58.5×10^3
Beryllium	1.82	.066	28×10^6	40×10^6	15.4×10^6	4.84	.38	92	.516	12.4×10^{-6}	6.9×10^{-6}	59.5×10^3
Pyroceram (9608)	2.50	.090	8.7×10^6	12.5×10^6	3.48×10^6	1.10	.0047	1.14	.19	40×10^{-6}	$.22 \times 10^{-6}$	52.0×10^3
"Fomerglass"	.163	.0052	12×10^6	18×10^6	84×10^6	.25	.00014	.033	.20	8.3×10^{-6}	4.6×10^{-6}	$.085 \times 10^3$
Silica-Slip Cast	1.9	.069	7.0×10^6	10.1×10^6	3.68×10^6	1.16	.00078	.188	.22	$.54 \times 10^{-6}$	$.30 \times 10^{-6}$	6.5×10^3
Aluminum	2.70	.097	6.9×10^6	10.0×10^6	2.56×10^6	.80	.53	128	.215	23.9×10^{-6}	13.3×10^{-6}	100×10^3
Alloy LA-685 (Super Invar)	8.13	.296	13.8×10^6	20×10^6	1.70×10^6	.53	.026	6.3	.12	0.1×10^{-6}	$.06 \times 10^{-6}$	2164×10^3

I. .07 25-30 357 429

X X

-100 +200° 7
300 600 2.5

II. .07 7-10 100 143

X X

-100 +200° 7
300 +200° 2

Case I. 70% boron - 30% Resin

Case II. 20% boron - 50% Glass - 30% Resin

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Pyrex (7740)	2.35	.085	6.8×10^5	9.8×10^6	2.89×10^6	.91	.0027	.50	.25	.25	3.2×10^{-6}	1.8×10^{-6}	3.38×10^3	106		
Vycor (7960)	2.18	.079	6.7×10^5	9.7×10^6	3.07×10^6	.97	.0022	.53	.19	.19	$.80 \times 10^{-6}$	$.44 \times 10^{-6}$	14.5×10^3	.43		
Invar (36MM)	3.0	.292	14.8×10^5	21.4×10^6	1.85×10^6	.58	.026	6.3	.095	.095	1.3×10^{-6}	$.70 \times 10^{-6}$	190×10^3	5.95		
Titanium	4.54	.164	11.6×10^6	16.8×10^6	2.55×10^6	.80	.042	10.1	.126	.126	8.5×10^{-6}	4.7×10^{-6}	39.1×10^3	1.22		
Magnesium	1.74	.063	4.5×10^6	6.5×10^6	2.59×10^6	.81	.38	92	.25	.25	26×10^{-6}	14×10^{-6}	58.5×10^3	1.83		
Beryllium	1.82	.066	28×10^6	40×10^6	15.4×10^6	4.84	.38	92	.516	.516	12.4×10^{-6}	6.9×10^{-6}	59.5×10^3	1.66		
Pyroceram (9608)	2.50	.090	8.7×10^6	12.5×10^6	3.48×10^6	1.10	.0047	1.14	.19	.19	40×10^{-6}	$.22 \times 10^{-5}$	62.0×10^3	1.95		
Foamglass	.143	.0052	$.12 \times 10^6$	$.18 \times 10^6$	$.84 \times 10^6$.26	.00014	.033	.20	.20	8.3×10^{-6}	4.6×10^{-6}	$.085 \times 10^3$.0027		
Silica-Slip Cast	1.0	.069	7.0×10^6	10.1×10^6	3.68×10^6	1.16	.00078	.188	.22	.22	$.54 \times 10^{-6}$	$.30 \times 10^{-6}$	6.5×10^3	.206		
Aluminum	2.70	.097	6.9×10^6	10.0×10^6	2.56×10^6	80	.53	128	.215	.215	23.9×10^{-6}	13.3×10^{-6}	100×10^3	3.14		
Alloy LA-685 (Super Invar)	8.13	.296	13.8×10^6	20×10^6	1.70×10^6	.53	.026	6.3	.12	.12	0.1×10^{-6}	$.06 \times 10^{-6}$	2165×10^3	68.0		

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